CASE STUDY FROM TRANS-NZOIA COUNTY, KENYA

Interrupted Time Series Study of Adult Perceptions Regarding COVID-19 Vaccine

SABIN VACCINE INSTITUTE

AMUA SIKHENDU MEDICAL CENTER (AMUA-SMC)

University of Nairobi

The pilot project was conducted in Kenya's Trans-Nzoia County between January 2021 – October 2021. It was implemented through a partnership amongst the University of Nairobi, the AMUA Sikhendu Medical Center, Kitale County Hospital, and GrainBank and VaccineLink LTD, with funding from the Sabin Vaccine Institute. The project received ethics approval from the Kenyatta National Hospital - University of Nairobi Ethics and Research Committee.

KEY TAKEAWAYS

- **Deeply-rooted contextual challenges serve as barriers towards reinforcing corrective messaging regarding COVID-19 and COVID-19 vaccination: mistrust in the government and healthcare system**
- **Conduct social listening exercises to uncover and address anecdotal accounts of local adverse events following immunization circulating in social media platform news feeds – exogenous narratives will change and strategies must adapt, accordingly**
- **Strategies to boost social confidence in COVID-19 vaccination should center around the promotion of the safety, efficacy and importance of COVID-19 vaccines**

APPROACH

An interrupted time series analysis[1] was conducted to investigate the following amongst the adult population in Kiminini sub-county rural smallholdings of Trans-Nzoia County, Kenya:

- COVID-19 misinformation in trusted social networks to better understand the public's risk perception about COVID-19 and willingness to vaccinate for COVID-19 in future, and
- Testing and evaluation of a community-led virtual intervention that organically amplifies accurate COVID-19 messaging to debunk misinformation and increase acceptance of a COVID-19 vaccine.

The Interrupted Time Series Panel (ITSP) of randomly recruited 300 adult respondents, aged ≥ 18 years, included 75 healthcare workers of different cadres (e.g.; community health workers, nurses, nurse-aids, clinical officers, medical laboratory technicians and specialist doctors). Participants were interviewed virtually at regular intervals over seven months regarding their perception of COVID-19 and willingness to be vaccinated if accurate information and COVID-19 vaccines were made available. A corrective intervention on the ITSP was conducted for two weeks at midpoint and followed by three, post-intervention surveys within the ITSP at two-week intervals to assess its impact.

1 Hudson, J., Fielding, S. & Ramsay, C.R. Methodology and reporting characteristics of studies using interrupted time series design in healthcare. BMC Med Res Methodol 19, 137 (2019). https://doi.org/10.1186/s12874-019-0777-x.

IMPLEMENTATION STAGES

Pre-Intervention

The ITSP's perceived susceptibility of and knowledge, misconceptions and misinformation about COVID-19; and acceptance of a COVID-19 vaccine is described in Table 1.

Table 1 - Baseline ITSP Findings

Indicator	Evidence	Examples
Perceived susceptibility of COVID-19	The majority of panelists (80%) did not perceive susceptibility to COVID-19 17% believed they would get a mild case 3% believed they had already had COVID-19 and survived	• Does not exist – government hoax • Disease of the rich, not poor • Mostly affects white people than black people • Keeping up with safety measures • The curve is already flattened • God will protect me
Knowledge, misconceptions and misinformation about COVID-19	The majority of panelists (81%) were aware of COVID-19, its symptoms, and its preventative measures, with the most common sources of information being television, radio, Facebook, WhatsApp, and Opera News. Panelists' lack of knowledge and misconceptions about COVID-19 were influenced through conspiracy theories, religious beliefs, and misinformation. Few HCWs (n=3/75) believed in publicly circulating misconceptions/misinformation centered around symptomatology and idiosyncratic themes.	Common COVID-19 misconceptions: • Was created to reduce the African population • Is a God-sent demonic animal spirit as punishment for human disobedience • Could be prevented by keeping warm, and/or using herbal medicines and home remedies, and/or praying to God • Could be treated in the same way common colds are treated (i.e.; menthol lozenges, decongestants, etc.)
Acceptance of COVID-19 vaccine	Of all panelists: 76% would accept a COVID-19 vaccine if made available 22% would have refused 2% were unsure **68% of HCW panelists would refuse a COVID-19 vaccine**	Reasons for acceptance: • Prevention is better as there is no cure • Fear of dying from COVID-19 Reasons for refusal: • Low perceived case and fatality rate in community • Lack of government vaccination guidelines • Not 100% effective • Not locally made or tested Reasons for indecision: • Fears of authenticity (real or fake) • Awaiting country leadership to participate first as examples

At baseline, the ITSP had strong opinions doubting, a) the existence of COVID-19, b) legitimacy, safety and efficacy of COVID-19 vaccines and c) whether it was necessary to receive a COVID-19 vaccine. There was an inequitable evidence-based healthcare service provision in COVID-19 testing, case management and vaccination, which led to deeply rooted mistrust in the political and healthcare system. Additionally, there was unavailability of testing in grassroots communities and unwillingness of local healthcare workers to accept COVID-19 vaccines.

Intervention

At midpoint, a team of researchers from the University of Nairobi jointly with local healthcare providers and trusted community voices within the target population (e.g.; clergy, elders, herbalists, civic/political representatives) designed and virtually delivered to the ITSP brief and concise corrective messaging to the misconceptions and misinformation identified at baseline. The intervention, containing both counter messaging and associated virtual ITSP engagement guide, was created through five, one-hour-long virtual workshops, and delivered to the ITSP through iterative virtual conversations.

Post-intervention

A survey was undertaken to assess the impact of the intervention on COVID-19 vaccine acceptance. A comparison of results is depicted below in Table 2.

Table 2 - Comparison and Baseline vs Post-Intervention COVID-19 Vaccine Acceptance

Indicator	Pre-Intervention	Post-Intervention
Acceptance of a COVID-19 vaccine of entire ITSP	76%	79%
Acceptance of a COVID-19 vaccine amongst HCWs	32%	26%

Furthermore, a wait-and-see attitude on vaccine acceptance, as shared by some panelists pointed to a possible desire to rule out adverse event after immunization (AEFI). Anecdotal reports of AEFI after COVID-19 vaccination by global social media platform newsfeeds may have contributed to this viewpoint.

Deductive reasoning surrounding low levels of vaccine acceptance amongst healthcare workers during project period

- Albeit rare, adverse events (myocarditis and pericarditis) were reported in people aged 16-24 who had received the mRNA vaccines[2]
- There was a temporary pause in the use of the Janssen COVID-19 vaccine due to an investigation of six cases of a rare and severe type of blood clot in individuals following vaccine administration[3]
- Countries paused briefly on using AstraZeneca COVID-19 vaccine due to fears over safety[4]

2 Centers for Disease Control and Prevention. Selected Adverse Events Reported after COVID-19 Vaccination. June, 2021. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/adverse-events.html

3 USFDA. FDA and CDC Lift Recommended Pause on Johnson & Johnson (Janssen) COVID-19 Vaccine Use Following Thorough Safety Review. April 2021. https://www.fda.gov/news-events/press-announcements/fda-and-cdc-lift-recommended-pause-johnson-johnson-janssen-covid-19-vaccine-use-following-thorough

4 The Economist. EU countries pause AstraZeneca's covid-19 jab over safety fears. March, 2021. https://www.economist.com/science-and-technology/2021/03/15/eu-countries-pause-astrazenecas-covid-19-jab-over-safety-fears

INFORMING COMMUNITY ACTION

Policy

- Prioritize health system strengthening and equitable healthcare service provision in COVID-19 testing, case management and vaccination to address community mistrust in political and healthcare systems
- Endorsement of COVID-19 prevention measures by politicians and public leaders through practice

Program

- Create additional training opportunities for healthcare workers and ensure they are aware of the safety and efficacy of the vaccines available in the country to increase vaccine acceptance amongst healthcare workers
- Conduct rigorous socio-behavioral research amongst healthcare workers to better understand barriers towards vaccine acceptance, as this population is highly influential of community behavior

Practice

- Deploy sustainable corrective messaging strategies, including tele-consultative and virtual engagements, amongst the community to address COVID-19 misconceptions and misinformation and change public perceptions
- Conduct social listening exercises to uncover and address anecdotal accounts of local adverse events following immunization circulating in social media platform newsfeeds – exogenous narratives will change and strategies must adapt, accordingly

RESEARCH LEADS

Benson Wamalwa, PhD, MSc

University of Nairobi

Benson Wamala holds a PhD in Biotechnology and Bioinformatics from Mie University and is a Research Scientist and Lecturer at the University of Nairobi in Kenya. Dr. Wamalwa is a member of the Saving Lives at Birth (SL@B) Community of Innovators; a grantee of the Stars in Global Health Innovation; an awardee of the Grand Challenges Explorations program; and a Volkswagen Foundation Fellow at the Leibniz University Hannover in Germany. His research interests are in global health innovations with emphasis on vaccinology, immunization and bioactive molecules from extremophiles.

Chrysanthus Wamela

Registered Nurse, Kenya AMAU